

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A process for preparing an F₂-containing gas comprising:

exciting at least one fluoro compound in a fluoro compound-containing gas by conferring energy on the fluoro compound-containing gas under reduced pressure; and

partially or completely converting the excited fluoro compound-containing gas containing the excited fluoro compound into F₂ under atmospheric pressure or a pressure that is over atmospheric pressure.

2. (Previously Presented) The process for preparing an F₂-containing gas of claim 1, wherein the exciting of a fluoro compound is performed in a first zone maintained under reduced pressure; and

the converting of the excited fluoro compound-containing gas into F₂ is performed in a second zone communicating with the first zone and maintained under atmospheric pressure or a pressure that is over atmospheric pressure.

3. (Previously Presented) The process for preparing an F₂-containing gas of claim 1 wherein the exciting of a fluoro compound is performed in a first zone maintained under reduced pressure; and

during transportation of the excited fluoro compound-containing gas to a second zone communicating with the first zone via a transportation system, the converting of the excited fluoro

compound-containing gas into F₂ comprises maintaining the pressure in the transportation system at atmospheric pressure or a pressure that is over atmospheric pressure.

4. **(Previously Presented)** The process for preparing an F₂-containing gas of claim 1, wherein the exciting of a fluoro compound is performed in a first zone maintained under reduced pressure; and

the converting of the excited fluoro compound-containing gas into F₂ is performed by maintaining the pressure in the first zone at atmospheric pressure or a pressure that is over atmospheric pressure.

5. **(Previously Presented)** The process for preparing an F₂-containing gas of claim 1, wherein the exciting of a fluoro compound is performed in a first chamber maintained under reduced pressure; and

the converting of the excited fluoro compound- containing gas into F₂ comprises transporting the excited fluoro compound-containing gas containing the excited fluoro compound from the first chamber to a second chamber maintained under atmospheric pressure or a pressure that is over atmospheric pressure via a gas channel connecting the first chamber and the second chamber.

6. **(Previously Presented)** The process for preparing an F₂-containing gas of claim 1, wherein the exciting of a fluoro compound is performed in a first chamber maintained under reduced pressure; and

the converting of the excited fluoro compound- containing gas into F₂ comprises maintaining the pressure in a transportation system at atmospheric pressure or a pressure that is over atmospheric pressure during transportation of the excited fluoro compound-containing gas containing the excited fluoro compound from the first

chamber to a second chamber via a gas channel connecting the first chamber and the second chamber.

7. (**Previously Presented**) The process for preparing an F₂-containing gas of claim 1, wherein the exciting of a fluoro compound is performed in a first chamber maintained under reduced pressure; and

the converting of the excited fluoro compound- containing gas into F₂ is performed in the first chamber by maintaining the first chamber under atmospheric pressure or a pressure that is over atmospheric pressure.

8. (**Previously Presented**) The process for preparing an F₂-containing gas of claim 5, wherein a vacuum pump is provided in a gas channel connecting the first chamber and the second chamber and said vacuum pump is used during the transporting of the excited fluoro compound-containing gas from the first chamber to the second chamber.

9. (**Previously Presented**) The process for preparing an F₂-containing gas of claim 1, wherein the exciting of a fluoro compound comprises generating a plasma state of the fluoro compound-containing gas.

10. (**Original**) The process for preparing an F₂-containing gas of claim 1, wherein the fluoro compound is a gaseous fluoro compound selected from the group consisting of linear, branched or cyclic saturated perfluorocarbons, linear, branched or cyclic unsaturated perfluorocarbons, carbonyl fluorides, perfluoro hypofluorides, perfluoro peroxides, perfluoroether compounds, oxygen-containing fluorides, interhalogen fluorides, iodine-containing fluorides, sulfur-containing fluorides, nitrogen-containing fluorides, silicon-containing fluorides, rare gas-containing fluorides, and

combinations thereof.

11. **(Original)** The process for preparing an F₂-containing gas of claim 1, wherein the fluoro compound is selected from the group consisting of CF₄, C₂F₆, C₃F₈, C₄F₁₀, C₅F₁₂, C₆F₁₄, C₂F₄, C₃F₆, C₄F₈, C₅F₁₀, C₆F₁₂, C₄F₆, FCOF, CF₃COF, CF₂(COF)₂, C₃F₇COF, CF₃OF, C₂F₅OF, CF₂(OF)₂, CF₃COOF, CF₃OOCF₃, CF₃COOOF, CF₃OCF₃, C₂F₅OC₂F₅, C₂F₄OC₂F₄, OF₂, SOF₂, SOF₄, NOF, ClF₃, IF₅, BrF₅, BrF₃, CF₃I, C₂F₅I, N₂F₄, NF₃, NOF₃, SiF₄, Si₂F₆, XeF₂, XeF₄, KrF₂, SF₄, SF₆, and a mixture thereof.

12. **(Original)** The process for preparing an F₂-containing gas of claim 1, wherein the fluoro compound-containing gas comprises an inert gas and/or oxygen.

13. **(Original)** The process for preparing an F₂-containing gas of claim 1, wherein the fluoro compound-containing gas comprises an inert gas and/or oxygen, and wherein said inert gas is selected from the group consisting of He, Ne, Ar, Xe, Kr, N₂, and a combination thereof.

14. **(Previously Presented)** The process for preparing an F₂-containing gas of claim 1, wherein the fluoro compound is one or more members selected from the group consisting of NF₃, C₂F₆, and FCOF.

15. **(Previously Presented)** The process for preparing an F₂-containing gas of claim 14, wherein generation of a plasma state of the fluoro compound is conducted in the presence of oxygen when the fluoro compound is a perfluorocarbon or a mixture containing one or more perfluorocarbons.

16. **(Previously Presented)** A process for modifying a surface of an article comprising contacting an F₂-containing gas with the surface of the article under reduced pressure or a pressure that is over atmospheric pressure or atmospheric pressure, wherein said F₂-containing gas is obtained by a process comprising:

exciting at least one fluoro compound in a fluoro compound-containing gas by conferring energy on the fluoro compound-containing gas under reduced pressure; and

partially or completely converting the excited fluoro compound-containing gas containing the excited fluoro compound into F₂ under atmospheric pressure or a pressure that is over atmospheric pressure.

17. **(Previously Presented)** The surface modification process of claim 16, further comprising introducing an inert gas and/or oxygen after conferring energy on the fluoro compound-containing gas before contacting the F₂-containing gas with the article to be surface-modified.

18. **(Original)** The surface modification process of claim 16, wherein the surface modification is performed by fluorinating the surface of the article.

19. **(Original)** The surface modification process of claim 16, wherein the article to be surface-modified is one or more members selected from the group consisting of metals, metal compounds and polymers.

20. **(Original)** The surface modification process of claim 19, wherein the polymer is an article based on polypropylene.

21. **(Original)** The surface modification process of claim 19, wherein the metal compound is one or more members selected from the group consisting of metal oxides, metal nitrides, metal carbides, metal hydroxides and metal chlorides.

22. **(Original)** The surface modification process of claim 19, wherein the metal compound is a compound based on Si.

23. **(Original)** The surface modification process of claim 22, wherein the compound based on Si is Si, SiO₂, Si₃N₄, SiC, polysilicon, amorphous silicon, or a combination thereof.

24. **(Original)** The surface modification process of claim 22, wherein the compound based on Si is deposited in an LPCVD equipment.

Claims 25 - 28 **(Cancelled)**.

29. **(Previously presented)** The process for preparing an F₂-containing gas of claim 6, wherein a vacuum pump is provided in a gas channel connecting the first chamber and the second chamber and said vacuum pump is used during transporting of the excited fluoro compound-containing gas from the first chamber to the second chamber.

30. **(Previously presented)** A process for modifying a surface of an article comprising contacting an F₂-containing gas with the surface of the article under reduced pressure or a pressure that is over atmospheric pressure or atmospheric pressure, wherein said F₂-containing gas is obtained by a process comprising:

exciting at least one fluoro compound in a fluoro compound-containing gas by conferring energy on the fluoro

In re Appln of Takashi TANIOKA et al
Appln. No.10/585,878
Reply to Office Action of August 19, 2010
Reply dated October 19, 2010

compound-containing gas under reduced pressure; and

partially or completely converting the excited fluoro compound-containing gas containing the excited fluoro compound into F_2 under atmospheric pressure or a pressure that is over atmospheric pressure,

wherein the exciting of a fluoro compound is performed in a first chamber maintained under reduced pressure; and

the converting of the excited fluoro compound-containing gas into F_2 comprises transporting the excited fluoro compound-containing gas containing the excited fluoro compound from the first chamber to a second chamber maintained under atmospheric pressure or a pressure that is over atmospheric pressure via a gas channel connecting the first chamber and the second chamber.